

The Cultivation of *Lactarius Volemus* in China

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The species *Lactarius volemus* (Fr. : Fr.) Fr. (Local name in Yunnan: Naijiangjun, meaning is a multi-milky fungus; English common name is weeping milky cap) is one of the most renowned commercialized edible ectomycorrhizal mushrooms in southwestern China. It is one of the largest volumes and often confused together with *L. rugatus*, *L. hatsudake*, *L. hygrophororoides* and *L. deliciosus* for sale in the agricultural markets. It is quite popular in southern Yunnan due to its unique flavor, nutrient elements and rich amino acid etc; some of them are exported abroad countries too. Due to over harvest for the past decade, the natural biomass has been begun to appear an obviously declining current in recent years.

Our research group has been focusing on the cultivation of *L. volemus* since 2001. Some modified media and ferment solution were invented for preparing strains, and the spawn made from the well mature fruiting bodies of *L. voelum* by triturating and mixed with the solution, and then keep more than 24 hours for mycelia and spores germination and growing in room temperature (24 - 32 °C). The fermentation spawn prepared in Jul. to Aug. 2001 and 2002 respectively and

then planting in a suitable adult pine (15 - 20 years old *Pinus kesiya* Royle ex Gord var. *langbianensis* as a dominative wood tree mixed with a few broad leaves trees of *Lithocarpus* spp. and *Castanopsis* spp.) forest. Some roots of the trees were cut off when ditching and planting spawn in order to promote to produce more new rootlets and form mycorrhizae infected by the fermented mycelia.

The first batch of fruiting bodies was observed by local farmers in the natural forest in July to September, 2004. Subsequently, the second and third batches of fruiting bodies were harvested in 2005, 2006, 2007 and 2008. There were 12 - 28 fruit-bodies in a cluster; a primary estimate of the volume production is up to more than 1000 g m² in planting sites. Generally, 3 - 4 times harvests could be collected in each year. Up to now the result has been confirmed by fruiting bodies ectomycorrhizal morphologic and anatomic characteristics as well as their molecular evidence validation (comparability up to 96% in the complete ITS sequences analysis). In order to validate and reconfirm for inoculation in more area to avoid its chanciness, we have planted more than 66 ha. since 2005 by same method.

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Fig .1 Adult pine (15 -20 years old *Pinus kesiya* Royleex Gord var. *langbianensis* as a dominative wood tree) forest .2, Technological training local farms; 3, *Lactarius volemus* (Fr .: Fr .) Fr . fruiting bodies were produced at the inoculation sites; 4 and 5, Ectomycorrhizae of *Pinus kesiya* var. *langbianensis* were formed by *L. volemus* infection . 6, news of the front page was reported by a local newspaper

Following the optimum requirements and methods for establishing a *L. volemus* plantation according to our primary experiment results are:

1, to make the fungus fermentation spawn solution;

2, to select a suitable symbiotic trees species forest (it should be the absence of trees with other competing fungi), to eliminate harmful weeds (such as *Eupatorium adenophorum* Spreng, English name: crofton weed) and to adjust soil pH (5.6 - 6.2);

3, to dig 15 - 20 cm wide and 8 - 15 cm deep grooves at 5 m alternation, at same times cut off some root (in order to produce new rootlets and synthesize more

ectomycorrhizae with the fungus), and then inoculation the fungus strain fermentation solution in grooves, the last recovered tightly with original soil;

4, Management after planting, such as irrigation water is necessary if drought; absolutely to eliminate some harmful weed as above mentioned; to prohibit human activity and keep away domestic animals from the plantation .

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